

Occupational Health and Safety Risks and Potential Health Consequences Perceived by U.S. Workers, 1985

SHARON SHILLING, MS
ROBERT M. BRACKBILL, PhD, MPH

Ms. Shilling is Epidemiologist and Dr. Brackbill is Health Statistician, Illness Effects Section, Surveillance Branch, Division of Surveillance, Hazard Evaluations, and Field Studies (DSHEFS), National Institute for Occupational Safety and Health (NIOSH). Tearsheet requests to Ms. Shilling, National Institute for Occupational Safety and Health, Robert A. Taft Laboratories, R-18, 4676 Columbia Parkway, Cincinnati, OH 45226.

Peggy Barker, Survey Statistician, Division of Health Interview Statistics, National Center for Health Statistics, assisted in developing coding guidelines. Joseph A. Seta, Industrial Hygienist, Hazard Section, DSHEFS, NIOSH, contributed to developing categories to assign responses, and Lois L. Schuster, Statistical Assistant, Illness Effects Section, Surveillance Branch, DSHEFS, NIOSH, assisted in data presentation.

Synopsis.....

Data from the Health Promotion and Disease Prevention Questionnaire, part of the 1985 National Health Interview Survey, were used to report workers' perceptions of occupational risk in their present jobs. This information will be used to monitor progress between 1985 and 1990 toward achieving broad goals in health promotion and disease prevention.

The proportions of currently employed persons who perceived exposure to health-endangering substances, work conditions, or risks of injuries were reported for age, race, sex, and occupation groups. Occupational groups were further characterized by the proportion of men and women who reported specific exposures (such as exposure to chemicals or to loud noise) and specific health consequences of exposure (such as risk of developing cancer or hearing impairment).

Greater proportions of men than women reported perceived risk from exposure to health-endangering substances, work conditions, and injuries in their present job. Also, a greater proportion of workers perceived risk of injury in their present job than other occupational risk categories. The greatest proportions of perceived exposure to occupational risk were reported by farm operators and managers, police and firefighters, and by workers in forestry and fishing occupations. Among workers reporting perceived exposures, chemicals, noise, and risk of injuries from vehicles were cited by the greatest proportion of workers, as were such health consequences as lung and respiratory problems and hearing impairment.

Data from this study may be used to target employment groups for health promotion or education and to develop indepth studies of specific occupational groups to reduce or prevent risk at the worksite.

WHAT DO WORKERS KNOW ABOUT THEIR occupational health and safety risks? What do they think these risks are, and what do they think are their consequences? Although information is available on acceptability of risk (1), risk management methods (2), and risk regulation (3), there is little information about workers' perception of occupational risk.

Occupational safety and health is 1 of the 15 priority areas identified in "Healthy People," the 1979 Surgeon General's Report on Health Promotion and Disease Prevention (4). This 1979 report describes a major initiative of the Department of

Health and Human Services and establishes broad goals for improving the health of the American people. Objectives for attaining the goals in each of the 15 priority areas are described in the 1980 Public Health Service report, "Promoting Health/Preventing Disease: Objectives for the Nation" (5). The target date for achieving these objectives is 1990. The following objective was established for occupational safety and health (5).

By 1990, at least 25 percent of workers should be able, prior to employment, to state the nature of their occupational health and safety risks and their potential

consequences, as well as be informed of changes in these risks while employed. (In 1979, an estimated 5 percent of workers were fully informed.)

The Health Promotion and Disease Prevention (HPDP) Questionnaire, part of the 1985 National Health Interview Survey (NHIS), was designed to obtain information to monitor progress toward achieving these broad goals. Data collected in the 1985 HPDP survey will help to establish a baseline of workers' perception of occupational risk. These baseline data then can be compared with 1990 data that will be collected with the same 1985 questionnaire to monitor progress toward achieving these goals in the intervening years.

In this paper we report workers' perceptions of exposures to health-endangering substances and work conditions in their present jobs and to risks of injuries. General exposures (such as exposure to health-endangering work conditions) are described in terms of workers' occupation, age, race, and sex. Specific exposures (such as exposure to loud or excess noise) and perceived health consequences (such as hearing impairment) are described by workers' occupation and sex. The variations in perceived exposure that are identified may help target employment groups for health promotion or education activities. These data may also identify employment groups experiencing exposures or health effects not previously documented by occupational health research. Moreover, the patterns of perceived occupational risk described in this paper also may lead to other more detailed studies of specific occupational groups resulting in reduction or prevention of occupational exposures.

Methods

The NHIS is a continuous, household survey of the civilian, noninstitutionalized population of the United States, and it is conducted by the National Center for Health Statistics (NCHS). This survey collects information on personal and demographic characteristics, illnesses, injuries, impairments, chronic conditions, and other health topics (6). The NHIS has been described in more detail elsewhere (7).

The 1985 HPDP Questionnaire was used to survey a subsample of the 1985 NHIS respondents on individual health behavior, knowledge of health practices, and perception of occupational risk. Prior to the HPDP interview, one family member age 18 or older was randomly selected from each family in each household in the basic NHIS

survey. An effort was made to interview the respondents in the evening or by telephone if they were unavailable when the interviewer arrived at the residence. Only preselected family members who were currently employed were asked the supplemental questions on occupational safety and health.

A currently employed person was defined as a person who was age 18 or older at the time of interview and reported that he or she worked at or had a job or business at any time during the 2-week period covered by the interview (8). Unemployed persons and persons not in the labor force were excluded. More information on the survey design and sampling scheme for the HPDP Questionnaire is presented in "The 1985 Health Promotion and Disease Prevention Survey" on pages 566-570 of the November-December 1986 issue of *Public Health Reports*.

The following questions were asked in the occupational safety and health section of the supplemental survey:

- 1a. In your present job, are you exposed to any substances that could endanger your health, such as chemicals, dusts, fumes, or gases?
- 1b. What substances are you exposed to that could endanger your health?
- 1c. How can (response in 1b) endanger your health?
- 2a. In your present job, are you exposed to any work conditions that could endanger your health, such as loud noise, extreme heat or cold, physical or mental stress, or radiation?
- 2b. What work conditions are you exposed to that could endanger your health?
- 2c. How can (response in 2b) endanger your health?
- 3a. In your present job are you exposed to any risks of accidents or injuries?
- 3b. What (other) risks of accidents or injuries are you exposed to?

The questions are structured such that a respondent would first indicate that he or she perceived exposure to health-endangering substances, work conditions, or risks of injuries and then specify the type of substances, work conditions, or risks of injuries to which they perceived exposure.

To assign responses to the open-ended questions on occupational exposure and related health effects, categories were developed by National Institute for Occupational Safety and Health (NIOSH)

industrial hygienists and epidemiologists. These categories are based on several established coding systems, such as those used to classify occupational exposure data from the National Occupational Hazard Survey (9), the ANSI Z-16 codes used by the Bureau of Labor Statistics and Workers' Compensation for classifying injury data (10), and the International Classification of Diseases, 9th Revision (ICD-9), used for classifying diseases (11). Information from field tests of the HPDP survey also was used to develop categories for classifying responses (see box for detailed list). Additional information on the categories in a coding appendix is available from the authors.

Up to six verbatim responses could be coded for each worker for each open-ended question on the type of substance, work condition, and risk of injury. Up to six corresponding health effects could be coded for each of the six possible substance responses and for the six possible work condition responses. In this paper we analyze the first reported substance, work condition, and injury, and the health effect first reported for the corresponding substance and work condition.

The 1985 HPDP survey collected information on workers' perceptions of exposure and related health effects, and the current occupation data were collected on the basic NHIS. A special data tape was prepared to link the occupation data from the basic NHIS to the HPDP data to facilitate characterizing occupational groups by workers' perceptions. This analysis is the first to use occupation data from the 1985 basic NHIS. The occupation data on the basic NHIS were obtained by asking respondents a series of questions about their current employment. Responses to these questions were used by coders to assign a three-digit occupation code to each employed respondent. The occupation codes are standard codes used by the U.S. Bureau of the Census to classify employment characteristics of individuals (12). Three-digit occupation codes were combined to create 42 categories of 2-digit codes; both 2-digit and 3-digit codes were used in our analysis.

National estimates of the number and percentage of currently employed persons with specific characteristics were calculated using the weights provided by NCHS on the final HPDP data tape. Estimates with a 30 percent or more sampling error are identified in the tables; these estimates generally have a confidence interval that is not useful for statistical comparisons.

It should also be noted that we analyzed the data parallel to the structure of the questions in

the survey. First, we report by different demographic groups proportions of workers who perceived exposure and then proportions of those who responded with specific substances, work conditions, or risk of injury.

Results

The percentages of currently employed persons who responded "yes" to each of the exposure categories on the occupational safety and health questionnaire by age, race, and sex are summarized in table 1. The sampling error for persons of races other than black or white was too great to present estimates for these persons as a separate group. However, persons of races other than black or white are included in the totals.

Approximately 40 percent of currently employed persons perceived exposure to risk of injuries in their present jobs. Thirty-five percent perceived exposure to health-endangering work conditions, and 34 percent reported exposure to health-endangering substances.

Proportions of workers reporting perceived exposure to hazardous substances or work conditions were similar across the three age categories, with the greatest proportions reported by persons ages 30-44 years old (36 percent perceived exposure to substances and 40 percent to work conditions that could endanger health). The greatest proportion of workers reporting perceived exposure to injuries (approximately 44 percent) were ages 18-29. Perceived exposure to injuries decreased with age to approximately 35 percent of workers ages 45 or older.

Greater proportions of men than women indicated they were exposed to risks in their present job. This pattern was consistent across each age category and for both blacks and whites. For example, 46 percent of white men ages 18-29 reported exposure to substances, compared with approximately 23 percent of white women in the same age group. Approximately 37 percent of black men ages 30-44 reported exposure to hazardous work conditions, compared with approximately 30 percent of black women in that age group, and 45 percent of white men ages 45 or older reported exposure to risk of injuries, compared with 22 percent of white women of comparable age.

Table 2 summarizes the proportion of workers in separate occupational groups who perceived exposure to health-endangering substances, work conditions, or risk of injuries. For most occupations, proportions of workers reporting perceived

Categories for Classifying Responses

Substances

Chemicals
Dusts
Fibers or fibrous materials
Anesthetic gases
Other gases, fumes, vapors, or mists
Disease or biological hazards
Radiation, radiation hazards

Work Conditions

Radiation, radiation hazards
Loud or excess noise
Extreme heat or cold
Physical stress
Mental stress
Uncomfortable work position or work condition
Vibration
Improper lighting

Risks of Accidents or Injuries

Injuries from powered equipment, machinery, or tools
Injuries from nonpowered equipment or tools
Injuries from overexertion in lifting objects
Injuries inflicted by person other than injured (except firearms)
Injuries from firearms inflicted by person other than injured
Injuries from falling or flying objects
Injuries from animals
Injuries from contact with temperature extremes—hot objects
Falls from elevation
Slips and falls onto same level
Falls, unspecified
Injuries from vehicles
Contact with electrical current
Drowning
Injuries from explosion

Asphyxiation

Lacerations, cuts, or bruises
Puncture
Amputation or crushing injury
Eye injuries
Other injuries

Health Consequences

Cancer
Tumors or growths (noncancerous or not specified)
Lung and respiratory problems other than cancer
Hearing impairment
Eye or vision problems
Genetic changes or reproductive problems
Infection
Skin diseases or disorders
Central nervous system problems or disorders
Asphyxiation
Headache
Psychological or behavioral problem
Digestive or gastrointestinal problem
Muscle, nerve, or bone problem
Frostbite or other effect from cold
Burns
Heat exhaustion, heat stroke, or other effect from heat
Death
Cardiovascular problems or disease
Blood diseases or disorders
Poisoning
Lowered resistance to disease
Injury, not elsewhere classified

Miscellaneous Responses

Other
Refused
Don't know

exposure to risk of injuries were much greater than the other risks. Perceiving risk of injury were more than 80 percent of workers in police and firefighting; forestry and fishing occupations; other transportation, except motor vehicles; and farm operating and managing occupations. The lowest proportions of perceived exposure to injury risk (less than 10 percent) were among those employed in financial records processing occupations and as secretaries, stenographers, and typists.

Exposure to hazardous substances was perceived by 76 percent of farm operators and managers and by 69 percent of mechanics and repairers. Proportions for secretaries and workers in financial processing occupations were again low, as were management-related occupations and other professional specialty occupations.

Occupational groups with 50 percent or more of workers perceiving exposure to health-endangering work conditions were, for the most part, blue collar occupations and included police and firefighters, material moving equipment operators, workers in health-diagnosing occupations, workers in health assessment and treating occupations, mechanics and repairers, construction laborers, farm operators and managers, those in construction and extractive trades, and health technologists and technicians. The lowest proportions of reported exposure to health-endangering work conditions (approximately 18 percent or less) were largely in white collar occupations and included other sales workers; workers in financial records processing; and secretaries, stenographers, and typists.

Table 1. Perceived exposure to health-endangering substances, work conditions, or risks of injuries in the present jobs of currently employed persons, by age, race, and sex, United States, 1985

Demographic characteristics	Total currently employed U.S. estimate (thousands)	Estimated percent of currently employed responding yes to "In your present job, are you exposed to—"		
		Any substances that could endanger your health, such as chemicals, dusts, fumes, or gases?"	Any work conditions that could endanger your health, such as loud noise, extreme heat or cold, physical or mental stress, or radiation?"	Any risks of accidents or injuries?"
Total	1,107,316	33.9	35.2	39.3
18-29 years ¹	34,641	35.3	34.9	43.5
White men	16,489	46.5	43.2	57.0
White women	13,428	23.2	26.1	30.6
Black men	2,152	42.0	34.9	43.3
Black women	1,764	18.9	25.4	26.9
30-44 years ¹	40,781	36.0	39.5	39.3
White men	20,239	46.6	48.4	51.8
White women	14,993	23.3	30.3	24.8
Black men	2,086	44.0	36.9	49.1
Black women	2,159	25.5	29.5	24.3
45 years or older ¹	31,895	29.5	30.1	34.6
White men	16,342	37.1	34.4	45.3
White women	12,044	20.2	26.1	22.1
Black men	1,354	34.9	27.4	37.8
Black women	1,533	18.0	21.2	19.8

¹Includes persons of other races.

SOURCE: 1985 National Health Interview Survey.

This survey also permitted us to identify workers' perceptions of specific exposures in the workplace (such as exposure to chemicals or dusts) and related health consequences (such as cancer or respiratory disease). Tables 3-5 summarize the specific responses for workers who reported perceived exposure to substances, work conditions, and risk of injuries. For workers who reported exposure, these tables show the response categories ranked according to the proportions of workers who reported exposure to the risks shown.

We were also able to examine the distribution of specific perceived exposures and perceived health effects by workers in specific occupations. Only the more significant results by occupation are presented as examples of the findings from tables 3-5. Thus, we refer only to those proportions for which the numerator and denominator were large enough to have an approximate relative standard error of 30 percent or less and also only those occupations for which the percentage of "yes's" in response to questions on exposure to substances, work conditions, or risk of injury was greater than 50 percent. Tables of these proportions are available from the authors.

Perceived hazardous substances. Among workers perceiving exposures to hazardous substances, the

greatest proportion reported exposure to chemicals; dusts; and gases, fumes, vapors, or mists (table 3). Among the 44 percent of workers who perceived exposure to chemicals, a greater proportion of women ages 18-29 reported exposure than did any other age-sex group. The greatest proportions of women reporting exposure to chemicals were women farmers, excluding horticultural workers (79 percent) and hair dressers and cosmetologists (60 percent). Of men who perceived exposure, more than 70 percent in the following occupations reported exposure to chemicals: printing machine operators; engineering technicians, not elsewhere classified; and farmers, except horticulture workers.

For dusts, men and women ages 45 or older reported the greatest proportions of perceived exposure (table 3). Among men who thought they were exposed to hazardous substances, the greatest proportions reporting exposure to dust were sawing machine operators (91 percent) and carpenters (64 percent). Among women who perceived exposure, the greatest proportions were reported by textile sewing machine operators (77 percent).

Lung and respiratory problems, cancer, and burns were the health consequences perceived most often by workers reporting exposure to specific hazardous substances (table 3). Fifty percent of

workers who reported exposure to specific substances stated that exposure could endanger their health by causing lung and respiratory problems. Approximately 9 percent reported they could develop cancer as a result of their exposure to health-endangering substances, and 4 percent reported that exposure could result in burns.

Of workers who believed they were exposed to health-endangering substances, more than 70 percent of men in the following occupations reported that they could develop lung or respiratory problems as a consequence of their exposure: sawing machine operators; brickmasons and stonemasons; bus drivers; operating engineers; and automobile body and related repairers. Among women reporting exposure, 82 percent of textile sewing machine operators and 57 percent of hairdressers and cosmetologists indicated they could develop lung and respiratory problems.

Perceived hazardous work conditions. Among workers who thought they were exposed to health-endangering work conditions, noise was the condition reported most frequently. This was reported by greater proportions of men than women (nearly 2:1) for all age groups (table 4). There was a large number of occupations where noise was considered an occupational hazard by most male employees. For instance, of those reporting exposure, 90 percent of male inspectors, testers, and graders, and 89 percent of male aircraft engine mechanics reported exposure to noise as a work condition problem. More than 60 percent of men in at least 15 other occupations perceived exposure to noise as well.

Among workers who reported exposure to health-endangering work conditions, 32 percent thought that exposure could influence their health by impairing their hearing (table 4). Men reported the greatest proportions of perceived risk of hearing impairment. Although the proportions decreased with age for men, the proportion of women who reported their hearing could be impaired increased slightly with age. Of the men who believed they were exposed to health-endangering work conditions, more than 75 percent of those reporting risk of hearing impairment were aircraft engine mechanics; miscellaneous machine operators, not elsewhere classified; automobile body and related repairers; and operating engineers. Among women, 85 percent of miscellaneous machine operators and 76 percent of unspecified machine operators reported potential hearing impairment.

In general, mental stress was reported by greater

Table 2. Perceived exposure to health-endangering substances, work conditions, or risks of injuries of currently employed persons in their present jobs, by occupation, United States, 1985

Occupation ¹	Total currently employed (thousands)	Percent perceiving exposure to health-endangering—		
		Substances	Work conditions	Risks of injuries
All occupations.....	107,316	33.9	35.2	39.3
Architects and surveyors.....	² 120	² 18.3	² 28.3	² 23.3
Cleaning and building service.....	2,404	47.1	18.7	36.4
Computer equipment operators.....	720	² 16.9	36.8	² 12.1
Construction and extractive trades.....	4,906	63.9	50.1	71.9
Construction laborers.....	566	60.2	51.9	72.4
Engineers.....	1,975	35.0	40.2	36.4
Fabricators, assemblers, inspectors, and samplers.....	2,433	60.1	47.6	50.8
Farm operators and managers.....	1,450	75.8	51.9	81.5
Farm workers and other agricultural workers.....	1,582	54.8	39.8	62.3
Financial records processing occupations.....	2,355	13.6	17.8	7.1
Food service.....	4,361	19.2	28.8	50.7
Forestry and fishing occupations.....	186	² 35.5	² 54.8	86.6
Freight, stock and material handlers....	3,079	45.7	41.0	56.5
Health assessment and treating occupations.....	2,115	35.2	54.7	51.3
Health-diagnosing occupations.....	721	33.3	54.8	43.0
Health service.....	1,725	20.8	31.5	42.4
Health technologists and technicians....	1,146	39.4	50.0	45.5
Machine operators and tenderers, except precision.....	5,517	60.8	49.3	51.7
Mail and message distributing.....	762	33.6	43.2	53.7
Management-related occupations.....	3,699	13.5	30.2	11.8
Managers and administrators, except public administration.....	9,296	23.5	32.6	30.8
Material moving equipment operators.....	1,073	63.4	58.3	73.5
Mechanics and repairers.....	4,474	69.1	53.3	69.0
Motor vehicle operators.....	3,138	44.3	41.6	77.4
Natural math and computer scientists.	959	29.9	32.8	23.1

Continued next page

Table 2. Perceived exposure to health-endangering substances, work conditions, or risks of injuries of currently employed persons in their present jobs, by occupation, United States, 1985—Continued

Occupation ¹	Total currently employed (thousands)	Percent perceiving exposure to health-endangering—		
		Substances	Work conditions	Risks of injuries
Officials and administrators, public administration	525	20.4	32.6	216.8
Other administrative support	8,195	19.1	28.2	19.6
Other professional specialty occupations	1,948	11.3	38.7	21.9
Other protective service occupations	1,005	28.5	38.9	63.8
Other sales	5,482	18.2	17.0	28.2
Other transportation, except motor vehicles	193	275.1	270.5	86.0
Personal service	2,131	33.4	18.8	20.6
Police and firefighters	921	50.1	76.4	86.9
Precision production occupations	4,230	56.7	47.5	56.1
Private household occupations	839	215.4	27.5	211.6
Sales representatives, commodities and finance	3,311	15.8	25.1	32.9
Secretaries, stenographers, and typists	4,817	10.9	18.1	7.8
Supervisors and proprietors	3,204	21.6	25.7	34.7
Teachers, librarians, and counselors	4,615	22.4	32.3	20.5
Technologists and technicians except health	2,087	39.2	40.3	32.1
Writers, artists, entertainers and athletes	1,952	27.4	28.2	27.3

¹Occupation coded to the 1980 U.S. Bureau of the Census codes. See Occupation Recode Outline, appendix C, in the 1985 National Health Interview Survey/Health Promotion and Disease Prevention Provisional Data Tape Documentation for the list of occupations and corresponding codes.

²Estimated sampling error greater than 30 percent.

SOURCE: 1985 National Health Interview Survey.

proportions of women than men (table 4). Of women and men reporting perceived exposure to health-endangering work conditions, 35 percent of female registered nurses and 65 percent of male physicians reported mental stress. Approximately 14 percent of workers who thought they were exposed to health-endangering work conditions indicated they could develop psychological or behavioral problems as a consequence of occupational exposure (table 4). Greater proportions of women than men consistently reported risks of

developing psychological or behavioral problems. For both men and women, the greatest proportions reporting these problems were ages 30–44 (table 4).

Perceived risk of injuries. In contrast to the decreasing proportion of responses across specific substance and work condition categories, the distribution of responses across specific categories of risk of injuries is more even. Although the highest proportion of response was for injuries from vehicles (17 percent), this category was followed closely by injuries from powered equipment, machinery or tools (14 percent) and by falls from elevation (10 percent) (table 5). High percentages of perceived risk of injury from vehicles are found in the following occupational groups: men who are driver-sales workers (89 percent); taxicab drivers and chauffeurs (86 percent); bus drivers (83 percent); sales representatives in mining, manufacturing, or wholesale (71 percent); drivers of heavy trucks (70 percent); or drivers of light trucks (70 percent); female bus drivers also reported a high percentage (94 percent). Eighty-eight percent of male supervisors in agriculture also indicated perceived risk of injury from powered equipment.

Discussion

Information on the occupational safety and health items on the 1985 Health Promotion and Disease Prevention Survey permitted us to identify a number of general patterns in the way workers perceive risk on the job. Moreover, this survey, when linked with occupational information from the 1985 basic NHIS, provided reasonably specific indications of perceived risk for occupation groups. Overall, we found that a greater proportion of currently employed men than women perceived risk from occupational exposure to health-endangering substances, work conditions, and risk of injuries. Greater proportions of both men and women reported perceived exposure to risk of injuries than to hazardous substances or work conditions, based on the proportion of workers responding “yes” to questions on perceived risk of injuries and on the number of specific occupations in which most workers reported perceived exposure. There was substantial agreement among workers in several occupations on risk of injuries. For example, almost 90 percent of workers in the following occupations perceived risk of injuries: police and firefighters, foresters and fisherman, other transportation workers, and farm operators and managers. Most of these

Table 3. Perceived exposure to health-endangering substances and perceived health effects—estimated percent distribution of currently employed persons in their present jobs, by age, and sex, United States, 1985

Category	Total all races	18–29 years		30–44 years		45 or older	
		Men	Women	Men	Women	Men	Women
Total currently employed U.S. estimate (thousands) ..	107,316	19,018	15,623	22,970	17,811	18,065	13,830
“In your present job, are you exposed to any substances that could endanger your health such as chemicals, dusts, fumes, or gases?”							
Percent of currently employed responding yes	33.9	45.7	22.7	45.7	23.5	36.8	20.0
<i>Substance first reported (percent of those persons responding yes)</i>							
“What substances are you exposed to that could endanger your health?”							
Chemicals	44.0	44.9	49.1	47.3	35.8	42.9	36.8
Dusts	24.3	24.9	21.3	21.0	22.5	28.3	31.3
Gases, fumes, vapors, or mists ¹	23.1	22.7	20.6	23.0	22.6	23.0	23.6
Fibers or fibrous materials	4.3	5.0	² 2.0	5.2	5.7	3.4	² 2.1
Radiation hazards	1.2	² 0.9	² 2.0	² 0.9	² 3.2	² 0.4	² 1.3
Disease or biological hazards	0.9	² 0.4	² 2.0	² 0.5	² 2.5	² 0.5	² 1.3
Anesthetic gases	² 0.3	¹ 0.1	² 0.6	² 0.4	² 0.9	0.0	² 0.4
<i>Health effect first reported (percent of those persons responding yes)</i>							
“How can (substance) endanger your health?”							
Lung and respiratory problems ³	50.0	49.3	41.7	49.3	51.5	52.1	57.5
Cancer	9.4	8.2	11.0	10.0	10.2	9.3	7.9
Burns	4.4	5.8	4.6	4.9	² 2.2	3.9	¹ 1.9
Skin diseases or disorders	3.5	4.4	5.2	3.0	² 3.1	3.0	² 2.2
Death	2.9	3.3	² 1.4	3.6	² 1.7	3.6	² 0.6
Eye or vision problems	2.5	3.4	4.7	1.8	² 1.7	² 1.3	² 3.8
Poisoning	2.2	2.2	² 1.4	2.9	² 0.7	2.5	² 1.6

¹Excluding anesthetic gases.

²Estimated sampling error greater than 30 percent.

³Other than cancer.

SOURCE: 1985 National Health Interview Survey.

occupation groups also had high proportions of perceived risk of exposure to health-endangering substances and work conditions.

Among workers indicating exposure to hazardous substances, by far the greatest proportion reported exposure to chemicals. Surprisingly, the greatest proportion of workers reporting potential chemical exposure were young women. Occupations with large proportions of women workers reporting exposure to chemicals included those with large proportions of young women, such as hairdressers and cosmetologists. Also, large proportions of men and women workers in agricultural occupations reported perceived chemical exposure and risk of injury.

Workers appeared more conscious of potential lung and respiratory effects than of any other potential health consequence. For example, 50 percent of workers with a substance exposure reported a risk of respiratory problems, compared with only 9 percent who reported a risk of developing cancer. We have not yet examined the

relationship between which health effect was specifically reported for which exposure, but it is interesting that respiratory problems were reported by greater proportions of workers than was cancer. Cancer has a long latent period and, therefore, may be less likely to become apparent while the worker is still employed. The more immediate health effect on the lungs and respiratory system may be perceived more readily by workers.

Noise was the hazardous work condition indicated by the greatest proportion of workers overall. Moreover, high proportions of workers in many different occupations reported the perception of noise exposure. They included not only workers in occupations where one might expect noise, such as aircraft engine mechanics, but also workers in occupations with probably less noise, such as inspectors, testers, and graders. It is not surprising then that potential hearing impairment was reported by the largest proportions of workers perceiving exposure to health-endangering work conditions. This observation demonstrates the con-

Table 4. Perceived exposure to health-endangering work conditions and perceived health effects—estimated percent distribution of currently employed persons in their present job, by age, and sex, United States, 1985

Category	Total all races	18-29 years		30-44 years		45 or older	
		Men	Women	Men	Women	Men	Women
Total currently employed U.S. estimate (thousands) . . .	107,316	19,018	15,623	22,970	17,811	18,065	13,830
"In your present job, are you exposed to any work conditions that could endanger your health, such as loud noise, extreme heat or cold, physical or mental stress, or radiation?"							
Percent of currently employed responding yes	35.2	42.1	26.1	46.6	30.3	33.7	25.5
<i>Work condition first reported (percent of those persons responding yes)</i>							
"What work conditions are you exposed to that could endanger your health?"							
Loud or excess noise	34.9	45.5	20.3	40.1	21.5	39.5	23.3
Mental stress	29.7	16.5	33.9	28.2	43.3	27.9	42.0
Extreme heat or cold	17.7	23.7	18.1	16.3	11.9	19.4	14.4
Radiation hazard	6.0	4.2	10.2	4.8	9.7	3.2	7.6
Physical stress	5.9	5.0	10.3	5.1	7.4	3.7	7.4
Uncomfortable work position or work condition	0.5	10.3	10.6	10.4	10.5	10.7	11.1
<i>Health effect first reported (percent of those persons responding yes)</i>							
"How can (work condition) endanger your health?"							
Hearing impairment	32.3	43.8	18.2	37.8	18.5	36.7	19.6
Psychological or behavioral problem	14.3	7.7	17.9	12.2	23.1	12.0	22.6
Cardiovascular problems or disease	13.5	8.0	11.6	15.6	14.5	14.3	17.6
Heat exhaustion, heat stroke, or other effect from heat	5.3	6.2	4.9	5.8	12.6	6.9	13.1
Lung and respiratory problems ²	4.6	4.7	5.4	2.6	5.5	5.5	6.3
Muscle, nerve, or bone problem	3.0	3.3	5.3	1.7	4.2	12.2	13.5

¹Estimated sampling error greater than 30 percent.
²Other than cancer.

SOURCE: 1985 National Health Interview Survey.

Among workers indicating exposure to hazardous substances, by far the greatest proportion reported exposure to chemicals. Surprisingly, the greatest proportion of workers reporting potential chemical exposure was young women workers.

sistency of reporting in the survey. Although effective measures and regulations exist for noise reduction in work situations, it is apparent that many people believe noise on the job is a major health hazard.

Also of interest is the large proportion of workers reporting mental stress. Although greater proportions of women than men reported mental stress, not enough information was available to

assess adequately in this report stress by women's occupations.

Our findings on perceived risk of injuries on the job indicate that approximately twice as many men as women believe they risk sustaining an occupational injury. It is interesting that a lower proportion of men in the younger age groups perceived risk of injuries from vehicles compared with older men. In reality, younger men are at greater risk of injury from accidents with vehicles (13). The relatively small percentage differences between perception of the danger of vehicles and other sources of injury do not agree with other data that show the proportion of occupational injuries caused by vehicles is about 30 percent (14).

The high risk of particular types of injuries reported by workers in certain occupations agrees with what others have observed. For instance, nearly 90 percent of supervisors in agricultural occupations perceived powered equipment to be a risk for injury. This result is supported by the 1982 Bureau of Labor Statistics Annual Survey

Table 5. Perceived exposure to risks of injuries—estimated percent distribution of currently employed persons in their present jobs, by age and sex, United States, 1985

Category	Total, all races	18–29 years		30–44 years		45 or older	
		Men	Women	Men	Women	Men	Women
Total currently employed U.S. estimate (thousands) ..	107,316	19,018	15,623	22,970	17,811	18,065	13,830
"In your present job, are you exposed to any risks of accidents or injuries?"							
Percent of currently employed responding yes	39.3	54.8	29.8	50.8	24.6	44.5	21.6
<i>Accident or injury first reported (percent of those persons responding yes)</i>							
"What risks of accidents or injuries are you exposed to?"							
Injuries from vehicles	16.9	14.7	7.8	19.9	12.1	24.8	12.7
Injuries from powered equipment, machinery, or tools	13.6	14.4	8.7	15.4	8.6	16.0	11.7
Falls from elevation	10.0	11.5	6.3	11.3	7.6	10.9	6.7
Injuries from falling or flying objects	8.0	9.7	5.5	9.0	3.7	9.1	14.6
Slips and falls onto same level	7.2	6.1	16.3	3.6	11.8	3.2	14.2
Injuries from over-exertion lifting objects	6.6	4.8	14.4	4.1	12.2	3.2	11.9
Injuries from contact with temperature extremes—hot objects	4.8	4.9	8.8	4.0	4.4	3.0	3.4
Injuries inflicted by person other than injured	4.5	2.6	6.0	2.9	11.5	2.8	9.5
Lacerations, cuts, or bruises	4.0	5.2	5.5	2.9	3.6	3.4	14.2
Injuries from nonpowered equipment or tools	3.7	5.3	3.9	3.0	13.2	3.1	12.8
Falls, unspecified	3.3	3.1	3.8	3.9	12.5	2.6	13.4
Amputation or crushing injury	3.1	4.8	11.8	3.2	11.9	3.0	11.2

¹Estimated sampling error greater than 30 percent.

SOURCE: 1985 National Health Interview Survey.

(14), which reported that agricultural service workers have a higher-than-average incidence of lost workday injuries.

We are aware of the potential bias introduced by specific examples of responses to the survey's questions and also aware of concerns about collecting subjective information on the public's assessment of risks, which cannot be externally verified (15). The examples within the questions could contribute to the large proportion of responses in these same categories (specifically, chemicals, dusts, gases, noise, mental stress, and heat or cold). For example, chemicals were reported by a considerably greater proportion of workers than were any other substances, including those listed in the question. The same phenomenon occurred for health-endangering work conditions, where large proportions of workers reported exposure to noise and mental stress, both of which were listed in the question. However, proportions for other work conditions also listed in the interview as examples, such as radiation and extreme heat or cold, were reported by relatively few persons. If data were biased because of respondents repeating examples given in the questions, it does not follow that only selected re-

sponses (such as chemicals and noise) would have high proportions of responses. Also, the actual answers people gave were plausible for the occupations they reported. For example, 86 percent of taxicab drivers reported injuries from vehicles if they believed they were at risk from accidents, and 91 percent of sawing machine operators reported exposure to dusts.

The analysis was restricted to the first substance exposure, work condition, or injury, and first health effect reported by each worker. Each respondent could have reported up to six specific exposures to health-endangering substances, work conditions, and risk of injuries. For each of the six exposures to substances and work conditions, workers could report up to six health consequences. By limiting our analysis, we intended to narrow our focus to those exposures uppermost in workers' minds and therefore more likely to represent perceived risk accurately. The impact on our results of examining only the first response is not substantial. For instance, roughly 50–60 percent of the respondents who answered "yes" to being exposed to a risk gave only one specific exposure. In cases where more than one exposure was reported, the additional responses were often

Moreover, high proportions of workers reported the perception of noise exposure in many different occupations, including not only workers in occupations where one might expect to have noise exposure, but also workers in occupations with probably less noise, such as inspectors, testers, and graders.

categorically the same. For example, several different kinds of chemicals may have been reported, but all were coded as chemicals. Further analysis would be needed to elucidate what biases are introduced if more than one response is examined.

There was enough consistency and plausibility in the patterns of responses that we can use this information to assess what workers perceive to be risks and establish these perceptions as baseline data for comparison with data that will be collected in the 1990 NHIS. In addition to performing more extensive analyses of the 1985 HPDP data, we will also compare these data with data collected on potential exposure to occupational hazards, such as data collected by NIOSH's National Occupational Hazard Survey (9). The 1985 HPDP data will be compared by occupation with potential exposures identified at the job site from the National Occupational Hazard Survey to determine how well workers' perceptions of exposure fit actual field observations. This comparison may provide another base from which to measure progress made toward the 1990 objectives for the nation.

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